"Claims"

CLAIMS

I claim:

1. A system for programming an application program controlling a factory automation device on a communication network, comprising:

a programming device operably connected to the communication network;

a program package embedded in the programming device, the program package for creating and editing the application program;

at least one web page resident on the programming device and operably connected to the program package, wherein the web page is accessible to a user using a web browser to edit the application program controlling the factory automation device.

2. The system of claim 1 wherein the web browser is resident within the programming device.

3. The system of claim 1 wherein the programming device is resident within the factory automation device.

4. The system of claim 1 wherein the application program is viewed as an at least one file within the programming device, accessible on the communication network using a standard File Transfer Protocol.

5. The system of claim 1 wherein the application program is converted by the program package and viewed on the web browser through either Java or HTML.

6. The system of claim 5 wherein the program package further includes a symbol editor and a language editor and wherein all symbols are stored within the programming device, allowing any authorized device coupled to the communication network to edit the application program.

7. The system of claim 1 wherein the factory automation device is a programmable logic

controller.

8. The system of claim 1 wherein the factory automation device is an IO module.

9. The system of claim 1 wherein the communication network is Ethernet.

10. The system of claim 1 further including an interface module for operably connecting the programming device to the communication network.

11. The system of claim 10 wherein the interface module includes:

a real time operating system operating a central processing unit;

a network interface for communicating with the communication network;

a driver for communicating with the programming device;

a protocol stack;

a client task for communicating with the protocol stack for initiating received requests;

a server task for communicating with the protocol stack for responding to received requests; and,

a protocol task for communicating with the protocol stack for receiving and responding to protocol task requests.

12. The system of claim 11 wherein the communication network is a world-wide network known as the Internet using an Internet Protocol (IP).

13. The system of claim 12 wherein the interface module functions as a web site on the Internet, the interface module including a global IP address.

14. The system of claim 13 wherein the protocol stack is a Transmission Control Protocol stack and wherein the protocol task includes a server task using a hypertext transport protocol (HTTP) task to deliver hypertext documents to the network interface.

15. The system of claim 14 wherein the HTTP task accepts a connection, parses an HTTP request, and calls the real time operating system to process the request.

16. The system of claim 15 wherein the interface module further includes a dual TCP/IP stack for data transferring comprising a first stack capable of handling a broad range of TCP/IP messages and a second stack capable of handling a less broad range of TCP/IP messages more quickly than the first stack.

17 A system for programming an application program controlling a factory automation device on a communication network, comprising:

means for coupling the factory automation device to the communication network;

means for editing the application program resident in a programming device; and,

an at least one Web page resident in the programming device, the Web page linked to the editing means resident in the programming device, wherein the Web page is accessible to a user using a web browser coupled to the communication network through the coupling means, and wherein the Web page allows the user to access the editing means to edit the application program controlling the factory automation device.

18. The system of claim 17 wherein the web browser is resident within the programming device.

19. The system of claim 17 wherein the programming device is resident within the factory automation device.

20. The system of claim 17 wherein the communication network is Ethernet.

21. The system of claim 17 wherein the application program is viewed as files within the programming device, accessible to the communication network using a standard File Transfer Protocol.

22. The system of claim 17 wherein the editing means includes a program package

whereby the application program is converted by the program package and viewed as either Java or HTML.

23. The system of claim 22 wherein the program package further includes a symbol editor and a language editor wherein all symbols are stored within the programming device, allowing any authorized device coupled to the communication network to edit the application program.

24. The system of claim 17 wherein the coupling means includes an interface module, the interface module including:

a real time operating system operating a central processing unit;

a network interface for communicating with the communication network;

a driver for communicating with the programming device;

a protocol stack;

a client task for communicating with the protocol stack for initiating received requests;

a server task for communicating with the protocol stack for responding to received requests, and,

a protocol task for communicating with the protocol stack for receiving and responding to protocol task requests.

25. The system of claim 24 wherein the communication network is a world-wide network known as the Internet using an Internet Protocol (IP).

26. The system of claim 25 wherein the interface module functions as a web site on the Internet, the interface module including a global IP address.

27. The system of claim 26 wherein the protocol stack is a Transmission Control Protocol stack and wherein the protocol task includes a server task using a hypertext transport protocol (HTTP) task to deliver hypertext documents to the network interface.

28. The system of claim 27 wherein the HTTP task accepts a connection, parses an

HTTP request, and calls the real time operating system to process the request.

29. The system of claim 28 wherein the interface module further includes a dual TCP/IP stack for data transferring comprising a first stack capable of handling a broad range of TCP/IP messages and a second stack capable of handling a less broad range of TCP/IP messages more quickly than the first stack.

30. A method of programming an application program for controlling a factory automation device operably connected to a communication network, the method comprising the steps of:

providing a programming device for accessing the application program;

viewing the application program using a web browser operably connected to the programming device; and,

editing the application program via a program package resident in the programming device.

31. The method of claim 30 further including transferring the application program to the factory automation device.

32. The method of claim 30 wherein the web browser is resident within the programming device.

33. The method of claim 30 wherein the programming device is resident within the factory automation device.

34. The method of claim 30 wherein the application program is viewed as an at least one file within the programming device, accessible on the communication network using a standard File Transfer Protocol.

35. The method of claim 34 wherein the application program is converted by the program package and viewed on the web browser through either Java or HTML.

36. The method of claim 35 wherein the program package further includes a symbol editor and a language editor and wherein all symbols are stored within the programming device, allowing any authorized device coupled to the communication network to edit the application program.

37. The method of claim 30 wherein the factory automation device is a programmable logic controller.

38. The method of claim 30 wherein the factory automation device is an IO module.

39. The method of claim 30 wherein the communication network is Ethernet.

40. The method of claim 30 further including an interface module for operably connecting the programming device to the communication network.

41. The method of claim 40 wherein the interface module includes:

a real time operating system operating a central processing unit;

a network interface for communicating with the communication network;

a driver for communicating with the programming device;

a protocol stack;

a client task for communicating with the protocol stack for initiating received requests;

a server task for communicating with the protocol stack for responding to received requests; and,

a protocol task for communicating with the protocol stack for receiving and responding to protocol task requests.

42. The method of claim 41 wherein the communication network is a world-wide

network known as the Internet using an Internet Protocol (IP).

43. The method of claim 42 wherein the interface module functions as a web site on the Internet, the interface module including a global IP address.

44. The method of claim 43 wherein the protocol stack is a Transmission Control Protocol stack and wherein the protocol task includes a server task using a hypertext transport protocol (HTTP) task to deliver hypertext documents to the network interface.

45. The method of claim 44 wherein the HTTP task accepts a connection, parses an HTTP request, and calls the real time operating system to process the request.

46. The method of claim 45 wherein the interface module further includes a dual TCP/IP stack for data transferring comprising a first stack capable of handling a broad range of TCP/IP messages and a second stack capable of handling a less broad range of TCP/IP messages more quickly than the first stack.